



NEW MEXICO ENVIRONMENT DEPARTMENT GROUND  
WATER QUALITY BUREAU



UNDERGROUND INJECTION CONTROL

GENERAL DISCHARGE PERMIT

Certified Mail- Return Receipt Requested

**Facility Name:** Red River Chevron

**Facility Location:** 105 East Main Street, Red River, New Mexico  
Section 35, Township 29N, Range 14E  
Taos County

**Legally Responsible Party:** NMED Petroleum Storage Tank Bureau  
2905 Rodeo Park Drive East, Bldg. 1,  
Santa Fe, NM 87505  
505-476-4397

**Remediation Oversight Agency Contact:** NMED Petroleum Storage Tank Bureau  
Mr. Curtis Landers, Project Manager  
505-470-5277, Curtis.Landers@state.nm.us  
Contract #: 22 667 3200 0001

**Remediation or Injection Plan Identification:** Red River Chevron

**Permitting Action:** New DP-1938

**PPS Contact** Avery Young  
(505)699-8564/avery.young@state.nm.us

**EFFECTIVE DATE: XX/XX/XXXX** **TERM ENDS: XX/XX/XXXX**

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Justin D. Ball  
Chief, Ground Water Quality Bureau

## I. UIC GENERAL DISCHARGE PERMIT

The New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) issues this Underground Injection Control General Discharge Permit (UIC Permit) for the subsurface emplacement of additive fluids through a Class V UIC injection well for the purpose of facilitating vadose zone or groundwater remediation. The GWQB issues this UIC Permit to the New Mexico Environment Department (NMED) Petroleum Storage Tank Bureau (PSTB) (Permittee) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Ground and Surface Water Protection Regulations, 20.6.2 NMAC.

In issuing this UIC Permit, the GWQB has determined that the requirements of Subsection C of 20.6.2.3109 NMAC have been met. The activities authorized by this UIC Permit are principally governed by Red River Remediation (Injection Plan), under the authority of NMAC 20.5.119, Corrective Action for Storage Tank Systems Containing Petroleum Products, with oversight by the NMED PSTB. Compliance with this UIC Permit requires compliance with the terms, requirements, and conditions of the Injection Plan. The term of this UIC Permit shall be no longer than five years from the effective date of this UIC Permit.

The injection activities, the location of the injection site, the type of injection and quantities of additives being used are briefly described as follows:

### **Injection Activities (summary: including injection well type, number of wells, and injection frequency)**

Copy of the Injection Plan Attached (required): ☒

Summary of Injection Plan: Soil and groundwater impacted by the past releases of gasoline from underground storage tanks in the area will be remediated by injecting 800 pounds of Regenes PetroFix, a micro-scale activated carbon amendment, mixed with 40 pounds of electron acceptors. Boreholes will be advanced and amendments will be injected using a direct push rig. A licensed New Mexico Driller will perform the work. Work will be performed under the New Mexico State Contract 22 667 3200 0001 under the supervision and directives of the New Mexico Environment Department Petroleum Storage Tank Bureau (Release ID: 388; Facility ID: 30177).

### Injection Site Information

Depth to most shallow groundwater (required): ~5 ft

Existing concentration of total dissolved solids (TDS) in groundwater (required): 200-600mg/L

Location (required): Red River Chevron, 105 East Main Street, Red River, New Mexico

County (required): Taos

Latitude: 36.70771

Longitude: -105.40584

Map Showing Area of Injection Sites Attached (required): ☒

### Additives Being Used (including volumes, manufacturer, and mixing ratios)

Approximately 800 pounds of Regenesis PetroFix will be mixed with 40 pounds of electron acceptors and potable water for a total injectate volume of approximately 800 gallons and injected using a direct push rig. PetroFix is a suspension of 1-2 micron-size activated carbon with nitrate and sulfate electron acceptors. Sodium Nitrate and Ammonium Sulfate will be utilized by bacteria to degrade petroleum hydrocarbons and are anticipated to be used up by bacteria within one year after injection.

### Anticipated Precipitation, Dissolution, Adsorption, and Desorption Products

Activated carbon, similar to the one used for household drinking water filtration, is inert and will coat soil and adsorb petroleum hydrocarbons. Sodium Nitrate and Ammonium Sulfate are used as amendments within the mix to biologically degrade the adsorbed petroleum hydrocarbons. These amendments are utilized for the degradation of petroleum hydrocarbons by the native bacteria that incorporate them into the bacterial cells or use them for metabolism. Amendments are expected to be utilized by the bacteria within one year after the injection.

### Public Notice Posting Locations

2 inch by 3 inch Newspaper Ad required for Renewal applications.

**Newspaper:** Taos News or Red River Sun

3 inch by 4 inch Newspaper Ad required for New, Modification, and Renewal/Modification applications.

**Newspaper:** Taos News or Red River Sun

2 feet by 3 feet sign posted for 30 days in a location conspicuous to the public at or near the facility required for New, Modification, and Renewal/Modification applications.

**Sign Location:** On Site, 105 East Main Street, Red River, New Mexico.

8.5 inch by 11 inch or larger posted off-site location conspicuous to the public (e.g. public library). Required for New, Modification, and Renewal/Modification applications.

**Flyer Location:** Red River Library, 702 E. Main Street, Red River, NM 87558

This UIC Permit consists of the complete and accurate completion of this UIC Permit form as determined by the GWQB.

Issuance of this UIC Permit does not relieve the Permittee of the responsibility to comply with the WQA, WQCC Regulations, and any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

## **Signatures**

Signature must be that of the person listed as the legally responsible party on this application.

*I, the applicant, attest under penalty of law to the truth of the information and supporting documentation contained in this application for an Underground Injection Control General Discharge Permit.*

### **Applicant's Signature**

Signature: Lorena Goerger Digitally signed by Lorena Goerger  
Date: 2022.02.03 13:09:13 -07'00'

Date: \_\_\_\_\_

Printed Name: Lorena Goerger

Title: Program Manager, Remedial Action Program, PSTB

Applicant Note that Submissions Must Include:

- 1- One electronic copy of the application delivered to the GWQB via email or other format
- 2- Two hardcopies of the application delivered to: Ground Water Quality Bureau  
Harold Runnels Building  
1190 Saint Francis Drive  
P.O. Box 5469  
Santa Fe, NM 87502-5469
- 3- Payment by check or electronic transfer of one application fee of \$100.00

## **II. FINDINGS**

In issuing this UIC Permit, GWQB finds:

1. The Permittee is injecting fluids so that such injections will move directly or indirectly into groundwater within the meaning of Section 20.6.2.3104 NMAC.
2. The Permittee is injecting fluids so that such fluids will move into groundwater of the State of New Mexico which has an existing concentration of 10,000 mg/L or less of TDS within the meaning of Subsection A of 20.6.2.3101 NMAC.
3. The Permittee is using a Class V UIC well as described in 20.6.2.5002(B)(5)(d)(ii) NMAC for in situ groundwater remediation by injecting a fluid that facilitates vadose zone or groundwater remediation.
4. The Permittee is injecting fluids into groundwater in order to achieve the remediation goals identified in the Injection Plan.

## **III. AUTHORIZATION TO DISCHARGE**

The Permittee is authorized to inject chemical additives into groundwater in accordance with this UIC Permit and the Injection Plan under the oversight of NMED PSTB.

[20.6.2.3104 NMAC, Subsection C of 20.6.2.3106 NMAC, Subsection C of 20.6.2.3109 NMAC]

## **IV. CONDITIONS**

The conditions of this UIC Permit shall be complied with by the Permittee and are enforceable by GWQB.

1. The Permittee shall perform remediation activities in accordance with the Injection Plan and shall notify GWQB of any changes prior to making them.

[20.6.2.3107 NMAC]

2. The Permittee shall monitor the injection activities and their effects on groundwater quality as required by the Injection Plan and shall provide GWQB with electronic copies of the required reporting and any pertinent documentation of activities at the site.

[20.6.2.3107.A NMAC, 20.6.2.3109.A NMAC]

3. If the GWQB or the Permittee identifies any failure of the Injection Plan or this UIC Permit to comply with 20.6.2 NMAC not specifically noted herein, GWQB may require the Permittee to submit a corrective action plan and a schedule for completion of corrective actions to address the failure.

Additionally, the GWQB may require the Permittee to submit a proposed modification to the Injection Plan, this UIC Permit, or both.

[20.6.2.3107.A NMAC, 20.6.2.3109.E NMAC]

4. ADDITIONAL MONITORING REQUIREMENTS – (RESERVED) - Placeholder for any added monitoring and reporting requirements.
5. TERMINATION – Within 30 days of completion of activities authorized by this UIC Permit the Permittee shall submit a closure report and a request to terminate the UIC Permit to the GWQB for its approval. The closure report shall identify how the injection well(s) was (were) closed in accordance with the Injection Plan. The Permittee shall provide NMED PSTB with a copy of this closure report.

[20.6.2.5005 NMAC, 19.27.4 NMAC]

6. INSPECTION and ENTRY – The Permittee shall allow a representative of the NMED to inspect the facility and its operations subject to this UIC Permit and the WQCC regulations. The GWQB representative may, upon presentation of proper credentials, enter at reasonable times upon or through any premises in which a water contaminant source is located or in which are located any records required to be maintained by regulations of the federal government or the WQCC.

The Permittee shall allow the GWQB representative to have access to, and reproduce for their use, any copy of the records, and to perform assessments, sampling or monitoring during an inspection for the purpose of evaluating compliance with this UIC Permit and the WQCC regulations.

Nothing in this UIC Permit shall be construed as limiting in any way the inspection and entry authority of GWQB under the WQA, the WQCC Regulations, or any other local, state, or federal regulations.

[20.6.2.3107.D NMAC, NMSA 1978, §§ 74-6-9.B and 74-6-9.E]

7. MODIFICATIONS and/or AMENDMENTS – In the event the Permittee proposes a change to the injection plan that would result in a change in the volume injected; the location of the injections; or the concentration of the additives being injected by the facility, the Permittee shall notify GWQB prior to implementing such changes. The Permittee shall obtain approval (which may require modification of this UIC Permit) by GWQB prior to implementing such changes.

[20.6.2.3107.C NMAC, 20.6.2.3109.E and G NMAC]

8. COMPLIANCE with OTHER LAWS – Nothing in this UIC Permit shall be construed in any way as relieving the Permittee of the obligation to comply with all applicable federal, state, and local laws, regulations, permits, or orders.

[NMSA 1978, § 74-6-5.L]

9. PERMIT FEES – Payment of permit fees is due at the time of UIC Permit approval. Permit fees shall be paid in a single payment remitted to GWQB no later than 30 days after the UIC Permit effective date.

Permit fees are associated with issuance of this UIC Permit. Nothing in this UIC Permit shall be construed as relieving the Permittee of the obligation to pay all permit fees assessed by GWQB. A Permittee that ceases injecting or does not commence injecting during the term of the UIC Permit shall pay all permit fees assessed by GWQB. An approved UIC Permit shall be suspended or terminated if the facility fails to remit a payment by its due date.

[20.6.2.3114.F NMAC, NMSA 1978, § 74-6-5.K]

**INJECTION PLAN**  
**RED RIVER CHEVRON, 105 E. MAIN STREET, RED RIVER, NEW MEXICO**  
**STATE CONTRACT 22 667 3200 0001, RELEASE ID 388 FACILITY ID 30177**

## **INTRODUCTION**

EA Engineering, Science, and Technology, Inc. PBC (EA), on behalf of the New Mexico Environment Department Petroleum Storage Tank Bureau, is planning to conduct remediation activities under New Mexico State Contract No. 22 667 3200 0001 at the Red River Chevron (the site), located at 105 East Main Street, New Mexico (Release ID 421, Facility ID 30278). The objective of the remedial action is to inject Regenesis PetroFix™ to trap and treat recalcitrant hydrocarbon concentrations to facilitate a No Further Action at the site.

The site is located in Section 35, Township 29N, Range 14E, Taos County, at a latitude of 36.70771 and a longitude of 105.40584.

The remediation activities will be performed in accordance with the requirements of the New Mexico Petroleum Storage Tank Regulations, NMAC 20.5.119. EA maintains the New Mexico Construction Division GS-29 license and New Mexico Professional Engineer licensure. All remediation activities will be conducted under the direct supervision of a New Mexico Professional Engineer.

## **BACKGROUND**

A summary of the site background is provided below.

- In March 1990, the release of petroleum hydrocarbons was confirmed.
- In 1993, a soil vapor extraction (SVE) and sparge remediation system was installed and operated until October 1997.
- In 2008, sparge remediation wells were plugged and abandoned.
- In October 2019, monitoring well MW-3 contained benzene at a concentration of 200 µg/L, above the New Mexico Water Quality Control Commission (NMWQCC) standard of 5 µg/L.

The subsurface at the site consists of intercalated alluvial deposits comprised of 1- to 2-foot-thick gravelly silty sand with abundant angular rock fragments up to 2 inches in diameter. This is underlain by approximately 1 foot of fat clay and 0.5 foot of fine well-graded sand. The clay and sand are underlain by another coarse deposit similar to the 1- to 2-foot interval. Groundwater flow is to the northwest at a gradient of 0.04 foot per foot.

## **TARGET AREA AND CONTAMINANTS**

The objective of remediation will be to address recalcitrant benzene concentrations in the monitoring well MW-3. In recent years, this has been the only well that contained benzene concentrations above the NMWQCC standard. The remediation goal is to decrease the benzene concentration to below 5 micrograms per liter (µg/L).



**INJECTION PLAN**  
**RED RIVER CHEVRON, 105 E. MAIN STREET, RED RIVER, NEW MEXICO**  
**STATE CONTRACT 22 667 3200 0001, RELEASE ID 388 FACILITY ID 30177**

**REGENESIS PETROFIX™**

Microbial testing results indicated that both aerobic and anaerobic biodegradation pathways are taking place at the site. Regenesi PetroFix™, which is a suspension of 1-2 micron activated carbon with nitrate and sulfate electron acceptors, was selected as a trap-and-treat remediation amendment. PetroFix™ will remove hydrocarbons from the dissolved phase by adsorbing them onto activated carbon particles (“trap”). Thereafter, nitrate and sulfate electron acceptors will stimulate hydrocarbon biodegradation (“treat”). Nitrate is a fast-acting electron acceptor that will be utilized by bacteria first. This will be followed by the utilization of sulfate. Activated carbon will be self-regenerating as adsorbed contaminants degrade in time.

**DOSAGE**

Approximately 800 pounds of PetroFix™ will be mixed with 40 pounds of a mixture of Sodium Nitrate and Ammonium Sulfate and potable water. The target injectate volume is approximately 800 gallons. Initially, a small batch will be mixed and injected to determine a practical injectable volume. Based on that, the dilution with water will be adjusted to match site conditions. As bacteria degrade petroleum hydrocarbons, they use amendments to form new cells and for metabolism. Amendments are expected to be used up by the bacteria within one year after the injection.

**INJECTION METHODOLOGY, SPACING, TARGET ZONE**

Direct push technology will be used to inject the remediation fluids using a top-down application into injection points shown in Figure 1. A New Mexico Licensed Driller will perform the injection. The injectate will be delivered into the saturated impacted zone between approximately 5 and 15 feet bgs. If the refusal is encountered consistently, the injection interval will be adjusted to reflect site conditions. The injection will be started on the periphery and stepped away from the location to allow for pressure dissipation.

**MIXING AND INJECTION**

PetroFix™ and electron acceptors will be mixed with potable water using a mechanical mixer in a mixing vessel. An injection pump equipped with control valves and a pressure gauge will be used to inject the fluids through the injection tool. A high-pressure hose will be run from the pump to the top of the drilling rod. The injection volume will be measured using a mixing vessel or a totalizing flow meter. The injection volume, pressure, and times will be recorded on field forms. Activities will be documented by photographs.

**INJECTION PLAN**  
**RED RIVER CHEVRON, 105 E. MAIN STREET, RED RIVER, NEW MEXICO**  
**STATE CONTRACT 22 667 3200 0001, RELEASE ID 388 FACILITY ID 30177**

**MONITORING**

During injection, the following monitoring will be performed:

- The proportions of PetroFix™ acceptors and water in each batch will be recorded.
- Groundwater levels in wells MW-1, MW-4, and MW-12 will be measured prior to and during the injection.
- The injection interval, pressure, and volume for each borehole/interval will be recorded.

**PLUGGING AND RESTORATION**

Upon completion, injection boreholes will be plugged with bentonite pellets or grout. The surface will be restored to match existing conditions and materials, supplies, and equipment will be removed.

**REPORTING**

Upon completion, EA Engineering will prepare and submit to NMED PSTB and NMED GWQB a completion report documenting the injection.

**POST-INJECTION GROUNDWATER MONITORING**

The NMED PSTB will oversee and direct the post-injection monitoring. Groundwater samples will be collected from the site wells and analyzed for the following analyses:

- Volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method 8260B,
- Sulfate and Nitrate by EPA Method 300, and
- Total Dissolved Solids by Method SM 2540.

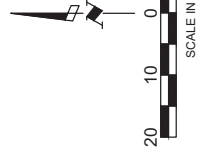
**INJECTION PLAN**  
**RED RIVER CHEVRON, 105 E. MAIN STREET, RED RIVER, NEW MEXICO**  
**STATE CONTRACT 22 667 3200 0001, RELEASE ID 388 FACILITY ID 30177**

**SITE LAYOUT AND INJECTION LOCATIONS**



**LEGEND:**

- MONITORING WELL
- PROPOSED BOREHOLE LOCATION WITH ROI
- GROUNDWATER FLOW DIRECTION
- APPROXIMATE EXTENT OF BENZENE



CHEVRON, RED RIVER  
105 EAST MAIN STREET  
NEW MEXICO

**FIGURE 1  
SITE LAYOUT AND  
PROPOSED INJECTION GRID**

PROJECT #	PROPOSAL	PROJECT PHASE	01	PROJECT MANAGER	VM
EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC. PBC					320 Gold Avenue, SW Suite 1300 Albuquerque, NM 87102 Phone: (505) 224-9013



105 East Main Street, Red River, NM, USA

Section 35 | Township 29 North, Range 14 East | New Mexico Principal Meridian | Taos, New Mexico | Long, Lat: -105.40584, 36.70771

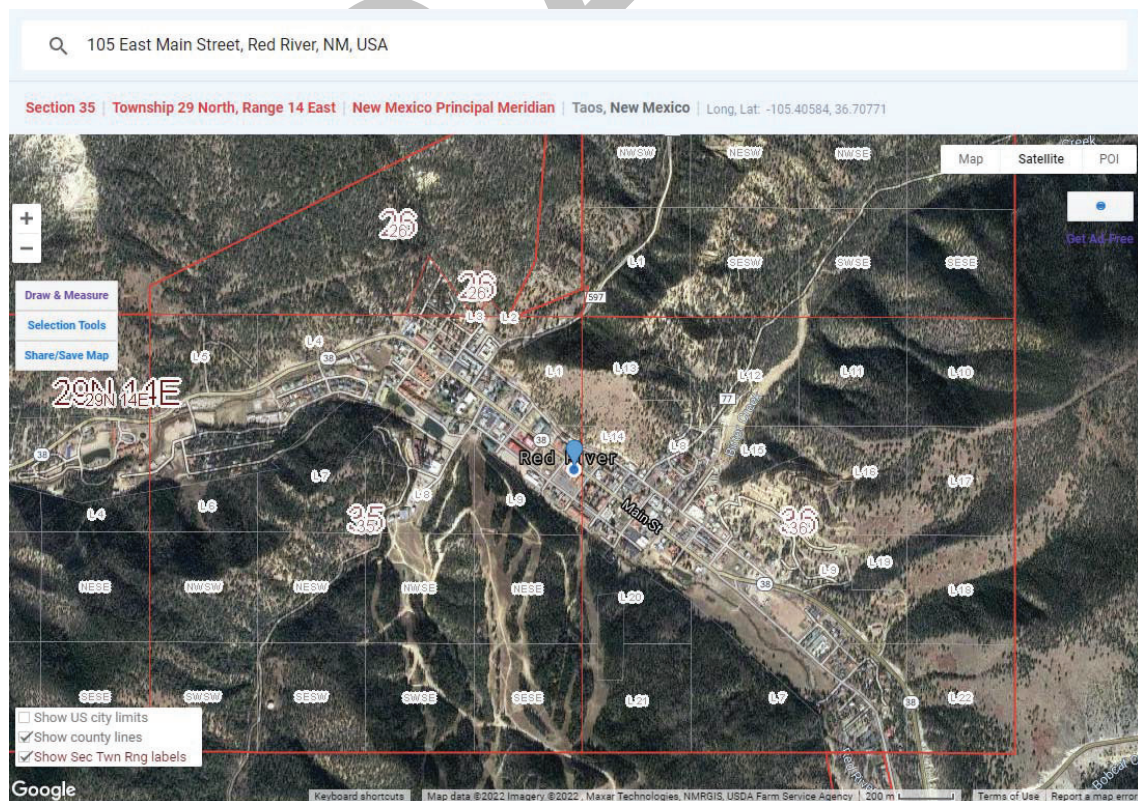
Draw & Measure  
Selection Tools  
Share/Save Map

Map Satellite POI

Get Ad-Free

Google

Keyboard shortcuts | Map data ©2022 200 m | Terms of Use | Report a map error



**INJECTION PLAN**  
**RED RIVER CHEVRON, 105 E. MAIN STREET, RED RIVER, NEW MEXICO**  
**STATE CONTRACT 22 667 3200 0001, RELEASE ID 388 FACILITY ID 30177**

**REGENESIS® PETROFIX™ SPECIFICATION SHEET**

# PetroFix™ Specification Sheet

## PetroFix Technical Description

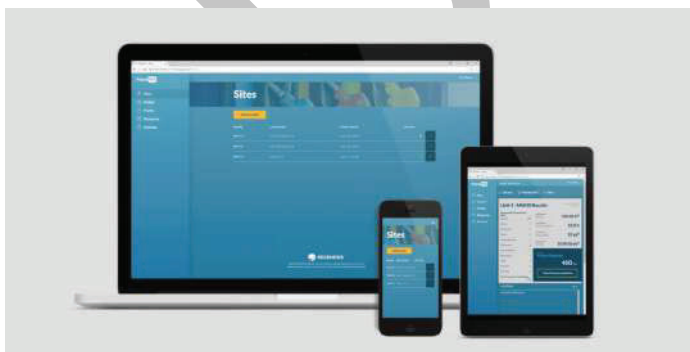
PetroFix is a new remedial technology designed to treat petroleum fuel spills in soil and groundwater. A simple-to-use fluid that can be applied under low pressure into the subsurface or simply poured into open excavations, PetroFix offers a cost-effective solution for environmental practitioners and responsible parties to address petroleum hydrocarbon contaminants quickly and effectively.

PetroFix has a dual function; quickly removing hydrocarbons from the dissolved phase, by absorbing them onto the activated carbon particles, while added electron acceptors stimulate hydrocarbon biodegradation in-place. PetroFix does not require high pressure “fracking” for application and can be applied with ease using readily available equipment associated with direct push technology.

The remedial fluid is a highly concentrated water-based suspension consisting of micron-scale activated carbon and biostimulating electron acceptors. PetroFix has a viscosity higher than water and is black in appearance. Its environmentally-compatible formulation of micron-scale activated carbon (1-2 microns) is combined with both slow and quick-release inorganic electron acceptors. A blend of additional electron acceptors is included along with the PetroFix fluid. Practitioners can select between a sulfate and nitrate combination blend (recommended), or sulfate only for the additional electron acceptors required.



## PetroFix Design Assistant



REGENESIS has developed a proprietary web-based design assistant called PetroFix Design Assistant™ that provides environmental professionals the ability to input their site parameters, determine the required product amount, and order the product through REGENESIS' customer service. The PetroFix Design Assistant includes defaults and warnings throughout the process to guide users toward effective designs that will offer best results.

To access the PetroFix Design Assistant, create an account and login at [www.PetroFix.com](http://www.PetroFix.com)

PetroFix Fluid Chemical Composition	Properties
<p>Activated Carbon - CAS 7440-44-0 &gt; 30%</p> <p>Calcium Sulfate Dihydrate - CAS 10101-41-4 &lt; 10%</p>	<p><b>Appearance:</b> Black Fluid</p> <p><b>Viscosity:</b> 1500-3500 cP (corn syrup-like)</p> <p><b>pH:</b> 8-10</p>

PetroFix Electron Acceptor Powder Chemical Composition	Properties
<p>OPTION 1 - EA Blend (preferred)</p> <p>Sodium Nitrate - CAS 7631-99-4, 50%</p> <p>Ammonium Sulfate - CAS 7783-20-2, 50%</p> <p>OPTION 2 - EA Blend NF</p> <p>Potassium Sulfate - CAS 7778-80-5, 50%</p> <p>Ammonium Sulfate - CAS 7783-20-2, 50%</p>	<p><b>Appearance:</b> White Powder</p>

Storage and Handling Guidelines	
<p><b>Storage:</b></p> <ul style="list-style-type: none"> <li>• Store away from incompatible materials</li> <li>• Store in original closed container</li> <li>• Store at temperatures between 40°F and 95°F</li> <li>• Do not allow material to freeze or store in direct sunlight.</li> <li>• Freezing and hot weather technical memo can be accessed at <a href="http://www.petrofix.com/resources">www.petrofix.com/resources</a> or at this <a href="#">link</a> here.</li> <li>• Dispose of waste and residues in accordance with local authority requirements</li> </ul>	<p><b>Handling:</b></p> <ul style="list-style-type: none"> <li>• Never add additives to solution prior to mixing with water</li> <li>• Wear appropriate personal protective equipment</li> <li>• Do not taste or ingest</li> <li>• Observe good industrial hygiene practices</li> <li>• Wash hands after handling</li> </ul>

## Applications

PetroFix is mixed with water on-site and easily applied onto the sub-surface using low pressure injections, or mixed in excavations. PetroFix is compatible with and can be used with ORC Advanced® to expedite rates of biodegradation. For more information about co-application with ORC Advanced, contact REGENESIS.